LAWRENCE LIVERMORE

REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: June 2-June 9, 2008.

How do you spell gas pump relief? H Y D R O G E N

KGO TV reporter Wayne Freedman (left) and KPIX TV cameraman Don Ford (right) are about to get a ride in the hydrogen vehicle as the Lab's Tim Ross gets ready to drive.

With gasoline prices on the rise, it may not be a bad idea to take a look at clean alternative fuel sources for the automobile.

Lawrence Livermore researchers are doing just that via a hydrogen-powered car that has the potential to emit little or no carbon dioxide.

As part of a national Department of Energy project, a team of Laboratory researchers at the Laboratory who designed the hydrogen-storage tank for the car recently reached another technical milestone: The tank can hold liquid hydrogen for six days without venting any of the fuel.

The LLNL development has significantly increased the amount of time it takes to start releasing hydrogen during periods of long-term parking, as compared to todayís liquid hydrogen tanks capable of holding hydrogen for merely two to four days.

Laboratory researchers unveiled their special hydrogen-powered vehicle to reporters last week, attracting print, radio and TV crews.

For a closer look, see https://newsline.llnl.gov/articles/2008/jun/06.06.08_hydrogenCar.php
Or watch the newsclips at http://abclocal.go.com/kgo/media?id=6186288 and
http://cbs5.com/environment/hydrogen.powered.hybrid.2.740683.html

From brilliant beams, fusion grows

Popular Mechanics takes a look at the Laboratory's National Ignition Facility and its target chamber, where 192 beams will converge on a target. These experiments will yield important data to ensure the safety and security of the U.S. nuclear stockpile. NIF also will be used to conduct fusion energy experiments on fusion energy, as well as advance basic science.

To learn more, see https://publicaffairs.llnl.gov/news/llnl_reports/popular-mechanics_nif_june2008.jpg

Lab-sponsored science fair winners win big at international competition

Dmitry Kislyuk (left), 12th grade student from California High School in San Ramon, and Harikrishna Rallapalli, a 10th grade student from Amador Valley High School in Pleasanton, won awards at the annual Intel International Science and Engineering Fair held in Atlanta.

Two senior sweepstakes winners of the 2008 Tri-Valley Science & Engineering Fair (TVSEF) sponsored by LLNL in March have gone on to win awards at the Intel International Science and Engineering Fair 2008. The Intel Fair was held in May in Atlanta.

In addition, one junior sweepstakes winner competed successfully at the 57th annual California State Science Fair held May 19-20, in Los Angeles.

Harikrishna Rallapalli, a 10th grade student from Amador Valley High School, picked up multiple awards for his project entitled, "Low-Cost Total Internal Reflection Microscopy." His awards included a $1,000 cash award and third place in the physics category; a special award of $1,500 from SPIE - International Society for Optical Engineering; and the sole

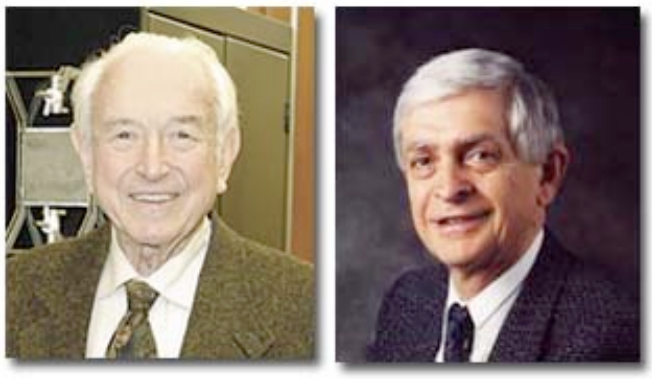
award of $10,000 bestowed by the Institute of Electrical and Electronics Engineers (IEEE) Foundation.

Dmitry Kislyuk, a 12th grade student from California High School, won a special award of $500 from the Association for the Advancement of Artificial Intelligence, for his project entitled, "Modeling Evolution: Exploring Computational Biology and Biomodeling."

Uzair Mohammad, an eighth-grade student from the Livermore Valley Charter School in Livermore, received an honorable mention in the junior division electronics and electromagnetics category at the California State Science Fair for his project, "Generation Nation: Generating Electricity with Everyday Motion."

For more see https://publicaffairs.llnl.gov/news/news_releases/2008/NR-08-06-01.html

Fusion Power Associates honors Lab pioneers



Dick Post and John Nuckolls

Two Lawrence Livermore scientists and fusion pioneers, Dick Post and John Nuckolls, will be honored in early December when an international fusion organization holds its annual meeting at the Laboratory.

Fusion Power Associates, a research and educational foundation dedicated to the development of fusion energy, will hold its first meeting ever at the Laboratory on Dec. 3-4.

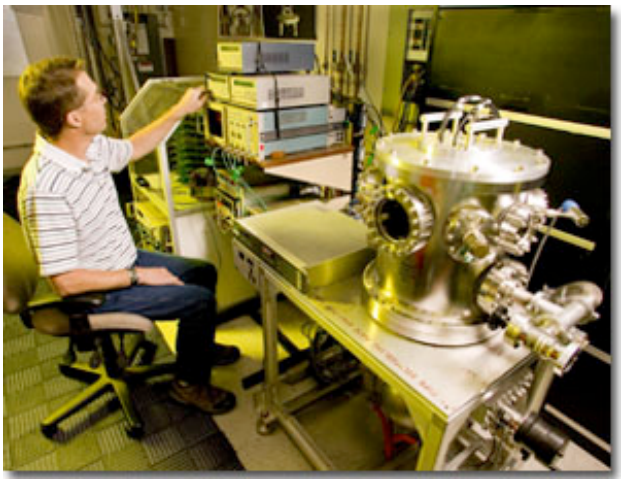
As part of its event, Fusion Power Associates will honor Post, a magnetic fusion researcher, and Nuckolls, an inertial fusion scientist and first post-Cold War LLNL director from 1988 to 1994.

Post came to the Laboratory within two to three months of its founding in 1952 and has conducted magnetic fusion energy and other scientific research for 56 years, still coming in to work several days a week now at age 89.

Nuckolls came to the Laboratory in 1955. His 53-year career has been devoted to the development of advanced inertial fusion concepts and applications. Today, Nuckolls is focused on the NIF Ignition Campaign, and beyond ignition and gain, to the development of laser-fusion power.

For more information, see https://newsline.llnl.gov/articles/2008/jun/06.06.08_fusion.php

Photo of the week



Promising protons — Jim Watson, a senior electrical engineer with Lawrence Livermore's Beam Research Program, adjusts a grid power supply on an injector/source test stand. Watson is part of a team of Laboratory scientists, engineers and technicians who are working with Wisconsin-based TomoTherapy Inc., and the U.C. Davis Cancer Center to develop a compact proton therapy system for treating cancer patients. Proton therapy is considered the most advanced form of

radiation therapy available, but size and cost have limited the technology's use to only six cancer centers nationwide.

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation’s science and technology community to bear on solving problems of national importance.

To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.

The Livermore Report archive, including today’s issue, is available at:
https://publicaffairs.llnl.gov/news/lab_report/2008index.html